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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,671

03/24/2006

David John Hill

124-1154

5058

23117 7590 08/31/2010  
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EXAMINER

KIM, ELLEN E

ART UNIT

PAPER NUMBER

2874

MAIL DATE

DELIVERY MODE

08/31/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,671	<b>Applicant(s)</b> HILL ET AL.	
	<b>Examiner</b> Ellen Kim	<b>Art Unit</b> 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

***This is responsive to Applicant's response with amendment filed on 6/29/10.***

### ***Response to Arguments***

Applicant's arguments with respect to all the claim have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-8, 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isao et al (JP 2003-254724, supplied by applicant after filing of appeal brief) in view of Hartog (USPAT 6,542,228).**

Isao discloses a fibre-optic surveillance system including:

a fibre-optic sensor array (fig. 1) comprising:

at least two fibre-optic point sensors 21-23; and

a distributed fibre-optic sensor 2s (see abstract, low sensitivity sensors) linking said at least two fibre-optic point sensors 21-23, wherein said sensor array provides an array output of sensed data from said at least two fibre-optic point sensors and said distributed fibre-optic sensor; and an interrogation system 7 (OTDR module),

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responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors, for establishing a position at which said force is applied.

Isao does not specifically show that the OTDR module is an interferometric module.

Hartog shows an interferometric OTDR module (see fig. 7 with Mach-Zehnder interferometers utilized instead of switches as taught in column 16, lines 1-4) which provide a more practicable method for overcoming the peak power limitations of optical fibers, and increase the probe energy launched into the fiber while avoiding detrimental effects, such as optical non-linearity or loss of spatial resolution (see column 6, lines 20-27).

Therefore it would have been obvious to the ordinary skilled person in the art at the time the invention was made to modify the Isao's device to include the interferometric OTDR module as shown in Hartog for the purpose of providing a more practicable method for overcoming the peak power limitations of optical fibers, and increasing the probe energy launched into the fiber while avoiding detrimental effects, such as optical non-linearity or loss of spatial resolution. It is clear this would improve the device.

Re claim 3, Isao show in fig. 1 that the fibre-optic sensor array is connected to the interrogation system by a fibre-optic cable.

Re claim 4, the strain gauge 22 is a transducer, therefore the fibre-optic sensor array is connected to the interrogation system by a transducer and a wire cable.

Re claim 5, fig. 5 and 6 show that the optical fiber wound into a flexural disc (the flexible portion 12 with the protrusion 16).

Re claims 6 and 7, the strain gauge 22s in the Isao's reference can be utilized as geophones and accelerometer (see last 6 lines of page 18 in translated version of Isao reference).

Re claims 10 and 11, Hartog shows in abstract that a pulsed reflectometric interferometric interrogation system.

Re claim 12, Hartog shows in column 9, lines 15-23 that the backscattered signals overlap in time but are distinguishable through their differing wavelengths. This shows that TDM is employed.

Re claims 13 and 14, Hartog discloses that the embodiment as shown in fig. 1 is appropriate for the OTDR using Rayleigh scattering in.

In re claims 15 and 16, Knudsen shows all the claimed structural limitations, and the claimed method steps are inherently done by the Knudsen device for the purpose of measuring and analyzing the optical signal.

### ***Conclusion***

In formation regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

For all official patent application related correspondence for organizations reporting to the Commissioner of Patents:

- Correspondence that is transmitted by facsimile must be directed to the central facsimile number, (703) 872-9306.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Further references of interest are cited on Form PLO-892, which is attachment to this office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellen Kim whose telephone number is (571) 272-2349. The examiner can normally be reached on Monday through Thursday.

/Ellen Kim/  
Primary Examiner,  
Art Unit 2874  
August 30, 2010/EK

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